

Red Pine Health Management Plan

I. Introduction

- A. Red pine is locally important tree species northeast of the Mississippi
- B. Naturally forms both mixtures and pure fire-origin stands
- C. Often grown in plantations

II. Consider management objectives

- A. Plantation management for timber production
- B. High volume, single-species stands
- C. Possibility to invest in stand tending

III. Consider tree species adaptations: *Pinus resinosa*

- A. Range (Burns et al 1990):

B. Sites:

- 1. Natural stands:

- 2. Plantations:

C. Climate:

- 1. Temperature:

- 2. Moisture:

D. Biology

- 1. Germination and establishment:

- 2. Seedling:

- 3. Competitors:

- 4. Growth:

IV. Disease complex: **Saratoga spittlebug**

A. Components

1. Diseased trees or plants:

a) Susceptible species

b) Symptoms

c) Diseased functions

(1) Tissue functions initially affected:

(2) Potential impact on whole tree functioning:

(3) Potential impact on forest functioning:

2. Primary stresses: Saratoga Spittlebug, *Aphrophora saratogensis* (Homoptera)

3. Environment:

B. Development of disease triangle over time

1. Predisposing factors

a) Tree adaptations to stress and environment

b) Degree of stress

(1) Life cycle

(2) Environmental conditions:

2. Inciting conditions

3. Contributing factors

C. Recommendations

1. Preemptive

a) What can increase tree resistance?

b) What can reduce the degree of stress?

2. Monitor and Survey

3. Reactive

a) What can increase tree resistance?

b) What can reduce the degree of stress?

(1) Biological controls

(2) Chemical controls

4. Feasibility of options

a) Economic

b) Ecological

c) Political

V. Disease complex: Scleroderris canker

A. Components

1. Diseased trees or plants

a) Susceptible species:

b) Symptoms:

c) Diseased functions

(1) Tissue functions initially affected:

(2) Potential impact on whole tree functioning:

(3) Potential impact on forest functioning:

2. Primary stresses: Scleroderris fungus, *Gremmenialla abietina*

(1) Two strains of this fungus have been identified:

(2) Signs:

3. Environment

B. Development of disease triangle over time

1. Predisposing factors

a) Tree adaptations to stress and environment:

b) Stand conditions:

c) Degree of stress (Skilling et al. 1979, 1986)

(1) Life cycle:

(a) Inoculation:

(b) Infection:

(c) Incubation:

(d) Symptom expression:

(e) Infectious period:

2. Inciting conditions

3. Contributing factors

C. Recommendations

1. Preemptive

a) What can increase tree resistance?

b) What can reduce the degree of stress?

2. Monitor and Survey

3. Reactive

a) What can increase tree resistance?

b) What can reduce the degree of stress?

4. Feasibility of options

a) Economic

b) Ecological:

c) Political:

VI. Health Management Plan for Red Pine

A. Preemptive measures

B. Monitor and survey

C. Reactive measures

1. Scleroderris canker:

2. Saratoga spittlebug:

D. Feasibility

Life cycle of Scleroderris canker

